

SUFFOLK COUNTY COMMUNITY COLLEGE
Department of Engineering Science and Industrial Technology

-Course Outline-

Course Title: CCNA R&S – Scaling Networks and Energy Management Course #: CYBT231
3 hours 3 credits

Prerequisite: CYBT121
Corequisite: CYBT 232

Text: 1. Scaling Networks v6 Companion Guide, Cisco Press
ISBN-13: 978-1-58713-434-0 (Pub Date August 2017)
2. Online Curriculum: Cisco Networking Academy NetSpace, <https://www.netacad.com>
3. Energy Management -Websites & professional periodical readings – TBD by the instructor.

Optional texts: 1. Scaling Networks v6 Lab Manual, Cisco Press
ISBN-13: 978-1-58713-433-3 (Pub Date August 2017)

Instructor: Name: Richard Johnston Term: Fall 2018
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Procedure: Students will be responsible for completing the online curriculum as well as reading text
Students are required to complete online chapter exams assigned for each week. The assigned chapter will be reviewed in class before each online exam.

Lab Procedure: Labs will be completed in class. The labs can be printed from the online curriculum, or the labs can be downloaded in Microsoft Word format from the student resources website provided. Students may use the electronic form of the lab and enter their results using the computers in the labs. Printing of labs is not to be done in the classroom. The labs will be collected electronically for grading at the instructor's discretion.

Attendance: Students are responsible for all that transpire s in class whether or not they are in attendance. All students are expected to attend every session of this course. Absences exceeding more than the equivalent of ONE WEEK of classes, may lead to failure or removal from the class roster.

Grading Policy: Chapter Exams = 15%
Labs/Class participation = 10%
Lab Proficiency tests = 25%
Final Exam = 50%

The Cisco Networking Academy Gradebook will compute grades for each CCNA course, with a certificate and congratulatory letter upon satisfactory completion.

Objectives: Upon completion of this course, the student will have completed the first of two courses that prepare students to take the Cisco ICND2 Certification Exam at a certified testing center. The Cisco CCNA® Routing and Switching curriculum provides a comprehensive overview of networking; from fundamentals to advanced applications and services. The Scaling Networks component describes the architecture, components, and operations of routers and switches in larger and more complex networks. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, and STP in both IPv4 and IPv6 networks.

Learning Outcomes

Students who complete the CCNA R&S - Scaling Networks course will be able to perform the following functions:

- Understand, configure and troubleshoot enhanced switching technologies such as VLANs, Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Plus Protocol (PVST+), and EtherChannel
- Understand, configure, and troubleshoot first hop redundancy protocols (HSRP) in a switched network
- Understand, configure, and troubleshoot Etherchannel-based networks
- Configure and troubleshoot routers in a complex routed IPv4 or IPv6 network using single-area OSPF, multiarea OSPF, and Enhanced Interior Gateway Routing Protocol (EIGRP)
- Manage Cisco IOS® Software licensing and configuration files

COURSE TOPICS

Week 1 Introduction to Scaling Networks

- Implementing a Network Design
- Selecting Network Devices

Week 2 Scaling VLANs

- Access Port Security
- Trunk Link Security
- Traffic Prioritization

Week 3 LAN Resiliency and Availability

- Spanning Tree Concepts
- Varieties of Spanning Tree Protocols
- Spanning Tree Configurations

Week 4 Link Aggregation

- Link Aggregation Concepts
- Link Aggregation Configuration
- First-Hop Redundancy Protocols
- EtherChannel Protocols

Week 5 Dynamic Routing

- IGP and EGP Routing
- Distance Vector Protocols
- Link State Protocols

Week 6 EIGRP

- Characteristics of EIGRP
- Configuring EIGRP for IPv4
- Operation of EIGRP
- Configuring EIGRP for IPv6

Week 7 – 8 EIGRP Advanced Configurations and Troubleshooting

- Advanced EIGRP Configurations
- Tuning EIGRP Routers
- Troubleshooting EIGRP

Week 9 Single-Area OSPF Operations and Configurations

- Single-Area OSPF Operations
- Advanced Single-Area OSPF Configurations

Week 10 Multiarea OSPF Operations and Configurations

- Multiarea OSPF Operation
- Configuring Multiarea OSPF

Week 11 -12 OSPF Tuning and Troubleshooting

- Troubleshooting Single-Area OSPF Implementations
- Troubleshooting Multi-Area OSPF Implementations

Week 13 Energy Management in Networks

- Power Requirements of Network Devices
- Power Calculations
- Energywise Commands and Operations

Week 14 IOS Images and Licensing

- Managing IOS System Files
- IOS Licensing

Week 15 Review and final exams: Written and practical components.